

## CLAIMS

### WE CLAIM:

1. A local coil for use in MRI systems comprising:  
antenna conductors fitting about a portion of a patient to detect NMR signals from the portion of a patient; and  
a motion sensor incorporated into the local coil and detecting motion of the portion of the patient to provide a signal indicating the motion;  
whereby motion causing image artifacts may be detected.
2. The local coil of claim 1 wherein the antenna conductors provide a volume for receiving a patient's head and detecting NMR signals therefrom, the volume allowing movement of the patient's head therein and wherein the motion sensor detects motion of the patient's head within the volume.
3. The local coil of claim 1 wherein the motion sensor is an accelerometer attached to the patient's head.
4. The local coil of claim 3 wherein the accelerometer is attached to the patient's head by a flexible strap.
5. The local coil of claim 1 including an optical fiber and wherein the accelerometer provides a photovoltaic cell receiving light power from the optical fiber to produce electricity for the accelerometer.
6. The local coil of claim 1 including a light-emitting device transmitting the signal indicating motion as a light signal.
7. The local coil of claim 6 including an optical fiber and wherein the light-emitting device transmits the signal indicating motion over the optical fiber.
8. The local coil of claim 7 including a second optical fiber and wherein the accelerometer includes a photovoltaic device receiving light power from the optical fiber to produce electricity for the accelerometer.

9. The local coil of claim 1 wherein the coil further includes a processor receiving the signal indicating motion and an NMR signal from the antenna conductors to correct the NMR signal according to the signal indicating motion.

10. The local coil of claim 9 wherein the processor zeros the NMR signals when the indication of motion is above a predetermined threshold.

11. The local coil of claim 1 wherein the processor corrects a phase of the NMR signals according to the motion signal.

12. A motion artifact correction system for local coils used with an MRI machine comprising:

a motion sensor providing a signal indicating motion of a portion of a patient imaged by a local coil; and

a processor system:

(i) receiving the indication of motion from the motion sensor;

(ii) receiving a detected NMR signal from the local coil;

(iii) correcting the NMR signal based on the indication of motion; and

(iv) providing the corrected NMR signal to the MRI machine.

13. The motion artifact correction system of claim 12 wherein the processor zeros the NMR signal when the indication of motion is above a predetermined threshold.

14. The motion artifact correction system of claim 12 wherein the processor corrects a phase of the NMR signal according to the motion signal.

15. The motion artifact correction system of claim 12 wherein the motion sensor is an accelerometer attached to a patient's head.

16. The motion artifact correction system of claim 12 including an optical fiber and wherein the accelerometer includes a photovoltaic device receiving light power from the optical fiber to produce electricity for the accelerometer.

17. The motion artifact correction system of claim 12 including a light emitting device transmitting the signal indicating motion as a light signal from the motion detector to the processor.

18. The motion artifact correction system of claim 17 including an optical fiber and wherein the light emitting device transmits the signal indicating motion over the optical fiber.

19. A patient motion detector for use with MRI machines comprising:  
an accelerometer;  
a strap for attaching the accelerometer to the patient; and  
an optical fiber providing communication between the accelerometer and a point remote from the accelerometer.

20. The patient motion detector of claim 19 wherein the accelerometer includes a photovoltaic device receiving light power from the optical fiber to produce electricity for the accelerometer.

21. The patient motion detector of claim 19 wherein the accelerometer includes a light emitting device transmitting the signal indicating motion as a light signal.

22. The patient motion detector of claim 21 including a second optical fiber and wherein the light emitting device transmits the signal indicating motion over the second optical fiber.